Collaborative Developments for Seismic Rehabilitation of Vulnerable Braced Frames

<table>
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<th>Project</th>
<th>Collaborative Developments for Seismic Rehabilitation of Vulnerable Braced Frames</th>
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<tr>
<td>Drawn by</td>
<td>Barb Simpson</td>
</tr>
<tr>
<td>Date</td>
<td>7/18/2014</td>
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<tr>
<td>Sensor Title</td>
<td>NCBF-B-1</td>
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</table>
Additional internal channels. Force and displacement from each actuator load cell.
Align with braced frame centerplane at middle of base plate.
LD-1
LD  Lateral Displacement Monitoring
1  1st Floor
2  2nd Floor

Align with beam centerline at each floor. Connect to supporting frame column by elbows HSS Aluminum pieces.

TILT1
TILT  Accelerometer monitoring angle of actuator brackets.
1  1st Floor
2  2nd Floor

Collaborative Developments for Seismic Rehabilitation of Vulnerable Braced Frames
BV-E1
BV  Beam Vertical Displacement
E  East   1  1st Floor
W  West   2  2nd Floor

Align with beam bottom flange and gusset edge.
(2) on either side of beam frame.
BROT-E1-1
BROT Beam Rotation Monitoring
E East 1 1st Floor
W West 2 2nd Floor
1,2 Outer Location, see drawing (1-top, 2-bottom)
3,4 Inner Location, see drawing (3-top, 4-bottom)

Target at column face (at stiffener for weak-axis column and flange for strong-axis column) at each floor.
A-E1-1
A Axial Deformation of Brace
E East 1 1st Floor
W West 2 2nd Floor
N North Facing Front View
S South Facing Back View
1,2 Wire pot from brace end-to-end
3,4,5,6 LVDT, see drawing for location (3,4-lower, 5,6-upper)

Brace axial deformation monitoring along the axis of brace. Support on brackets 4” or 5” from face of brace on both sides of brace. LVDT at ends of brace to monitor brace out-of-plane rotation. Wire pot to measure brace elongation.
BrOD–E1–1
BrOD Brace Out-of-plane Displacement
E East 1 1st Floor
W West 2 2nd Floor
1,2 Location, see drawing (1—outside, 2—inside)

(2) Wire Pots per Brace. Align at Brace Centerline. Connect to supporting frame. Target welded at brace midpoint.
BOD-E1-1
BOD Beam Out-of-plane Displacement
E East 1 1st Floor
W West 2 2nd Floor
1,2 Location, see drawing (1-top, 2-bottom)

Align with Edge of Gusset. Target at beam flange.
Gr-W23-1,2,3
Gr Gusset rosette
E East 1 1st Floor
W West 2 2nd Floor
1,2,3 Location, See Drawing
   (1-inner bottom, 2-outer bottom, 3-outer top)
   1-0deg. 2-90deg. 3-135deg.
Located on South Face of gusset.

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Drawn by Barb Simpson
Date 7/18/2014
Sensor Title Gusset Rosettes
NSG-E1b-1
NSG Net Section Strain Gage
E East 1 1st Floor b bottom
W West 2 2nd Floor t top
1,2,3,4 Location, See Drawing

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Collaborative Developments for Seismic Rehabilitation of Vulnerable Braced Frames
Additional internal channels. Force and displacement from each actuator load cell.
Align with braced frame centerplane at middle of base plate.

SLIP—BP—E
SLIP Slip Monitoring
BP Base Plate E East
W West
LD-1
LD  Lateral Displacement Monitoring
1  1st Floor
2  2nd Floor

Align with beam centerline at each floor. Connect to supporting frame column by elbowed HSS Aluminum pieces.

TILT1
TILT  Accelerometer monitoring angle of actuator brackets.
1  1st Floor
2  2nd Floor
BV-E1
BV Beam Vertical Displacement
E East 1 1st Floor
W West 2 2nd Floor

Align with beam bottom flange and gusset edge.
(2) on either side of beam frame.
BROT-E1-1
BROT Beam Rotation Monitoring
E East 1 1st Floor
W West 2 2nd Floor
1,2 Outer Location, see drawing (1-top, 2-bottom)
3,4 Inner Location, see drawing (3-top, 4-bottom)

Target at column face (at stiffener for weak-axis column and flange for strong-axis column) at each floor.
A-E1-1
A Axial Deformation of Brace
E East 1 1st Floor
W West 2 2nd Floor
N North Facing Front View
S South Facing Back View
1,2 Wire pot from brace end-to-end
3,4,5,6 LVDT, see drawing for location (3,4-lower, 5,6-upper)

Brace axial deformation monitoring along the axis of brace. Support on brackets 4” or 5” from face of brace on both sides of brace. LVDT at ends of brace to monitor brace out-of-plane rotation. Wire pot to measure brace elongation.
BrOD-E1-1
BrOD    Brace Out-of-plane Displacement
E   East    1   1st Floor
W   West    2   2nd Floor
1,2 Location, see drawing (1—outside, 2—inside)

(2) Wire Pots per Brace. Align at Brace Centerline. Connect to supporting frame. Target welded at brace midpoint.
BOD-E1-1
BOD  Beam Out-of-plane Displacement
E  East  1  1st Floor
W  West  2  2nd Floor
1,2  Location, see drawing (1-top, 2-bottom)

Align with Edge of Gusset. Target at beam flange.
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Gr-W13-1,2,3
Gr-E13-1,2,3
Gr-E12-1,2,3
Gr-E11-1,2,3
Gr-W12-1,2,3
Gr-W11-1,2,3

EAST

WEST

1 1st Floor
2 2nd Floor

1,2,3 Location, See Drawing
1—inner bottom, 2—outer bottom, 3—outer top
1,2,3 1—0deg. 2—90deg. 3—135deg.

Located on South Face of gusset.
Collaborative Developments for Seismic Rehabilitation of Vulnerable Braced Frames
SLIP-B
SLIP Slip Monitoring
B Beam
RW Reaction Wall
N North
S South

Act-1S
Act Actuator
N North  1  1st Floor
S South  2  2nd Floor

Additional internal channels. Force and displacement from each actuator load cell.
Align with braced frame centerplane at middle of base plate.
LD-1
LD Lateral Displacement Monitoring
1 1st Floor
2 2nd Floor

Align with beam centerline at each floor. Connect to supporting frame column by elbowed HSS Aluminum pieces.

TILT1
TILT Accelerometer monitoring angle of actuator brackets.
1 1st Floor
2 2nd Floor

Collaborative Developments for Seismic Rehabilitation of Vulnerable Braced Frames
Align with beam bottom flange and gusset edge.
(2) on either side of beam frame.
Target at column face (at stiffener for weak-axis column and flange for strong-axis column) at each floor.
A-E1-1
A Axial Deformation of Brace
E East  1  1st Floor
W West  2  2nd Floor
(N) North-Facing Front View
(S) South-Facing Back View
1,2 Wire pot from brace end-to-end
3,4,5,6 LVDT, see drawing for location (3,4-lower, 5,6-upper)

Brace axial deformation monitoring along the axis of brace. Support on brackets 4” or 5” from face of brace on both sides of brace. LVDT at ends of brace to monitor brace out-of-plane rotation. Wire pot to measure brace elongation.
NOTE: A-E1-3,4,5,6 are wirepots.
BrOD—E1—1
BrOD Brace Out-of-plane Displacement

E East 1 1st Floor
W West 2 2nd Floor
1,2 Location, see drawing (1—outside, 2—inside)

(2) Wire Pots per Brace. Align at Brace Centerline. Connect to supporting frame. Target welded at brace midpoint.
BOD–E1–1
BOD  Beam Out-of-plane displacement
E  East  1  1st Floor
W  West  2  2nd Floor
1,2  Location, see drawing (1-top, 2-bottom)

Align with Edge of Gusset. Target at beam flange.
PZr-E1-1,2,3
CVr-E1-1,2,3
PZr-E1-1,2,3
CVr-E1-1,2,3

See S10

Panel Zone rosette
Column Shear rosette

East 1 1st Floor  N North Shear Tab
West 2 2nd Floor  S South Dual Shear Tab Douber Plate
1,2,3 1–0deg.  2–90deg.  3–135deg.

Collaborative Developments for Seismic Rehabilitation of Vulnerable Braced Frames

Drawn by Barb Simpson
Date 8/6/2014
Sensor Title Column Rosettes
Align with brace workpoint

Gr-WP1-N,S-1,2,3
Gr-E1-N,S-1,2,3
Gr-E2-N,S-1,2,3
Gr-WP2-N,S-1,2,3
Gr-W1-N,S-1,2,3
Gr-W2-N,S-1,2,3

Gr-E1-N,S-1,2,3
Gr Gusset rosette
E East 1 top
W West 2 bottom
WP Workpoint
N,S North-facing and south-facing
1,2,3 1–0deg. 2–90deg. 3–135deg.

Rossettes on both sides of gusset plate at same locations.